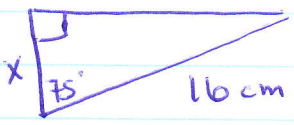
p 314 to 315 **Review** #1a, 2, 3, 5ac, 6, 7bc, 8, 9, 10

1a)



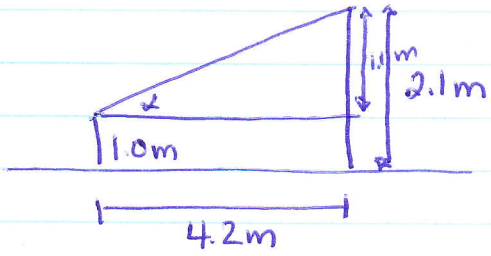
$\cos 75° = \frac{x}{16}$

$x = 16\cos 75°$

$x \doteq 4.14$

∴ side x is 4cm

2.

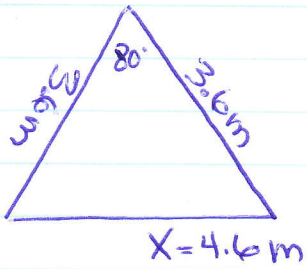


$\tan \alpha = \frac{1.1}{4.2}$

$\alpha = \tan^{-1}\left(\frac{1.1}{4.2}\right)$

$\alpha = 15°$

3.



$x^2 = 3.6^2 + 3.6^2 - 2(3.6)(3.6)\cos 80°$

$x^2 = 21.419...$

$x \doteq 4.6$

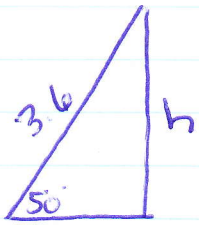
a) $P = 3.6 + 3.6 + 4.6$

$= 11.8$

$= 12$

∴ 12m of edging is needed.

b) $A = \frac{b \times h}{2}$



$\sin 50° = \frac{h}{3.6}$

$h = 3.6\sin 50°$

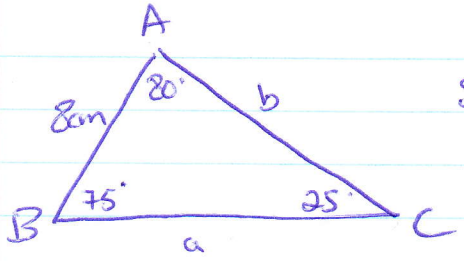
$h \doteq 2.76$

$= \frac{4.6 \times 2.76}{2}$

$= 6.4$

∴ the area of the triangle garden is $6.4\,m^2$

5a



Solve triangle (everything)

$\angle A = 180° - 75° - 25°$

$\angle A = 80°$

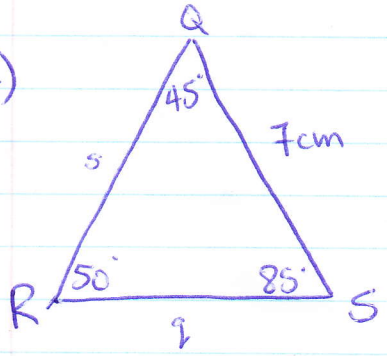
$$\frac{a}{\sin 80°} = \frac{8}{\sin 25°} \qquad \frac{b}{\sin 75°} = \frac{8}{\sin 25°}$$

$$a = \frac{8 \sin 80°}{\sin 25°} \qquad b = \frac{8 \sin 75°}{\sin 25°}$$

$a \doteq 19$ $\qquad b \doteq 18$

$\therefore \angle A$ is 80°, side a is 19cm and side b is 18cm.

c)



$\angle Q = 180° - 50° - 85°$

$= 45°$

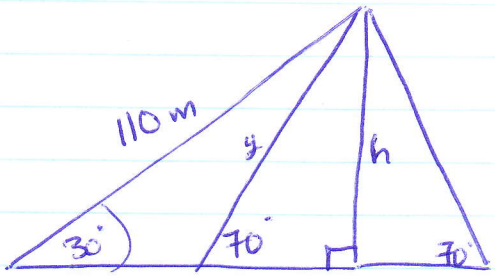
$$\frac{s}{\sin 85°} = \frac{7}{\sin 50°} \qquad \frac{q}{\sin 45°} = \frac{7}{\sin 50°}$$

$\therefore \angle Q$ is 45°, side s is 9cm and side q is 6cm.

$$s = \frac{7 \sin 85°}{\sin 50°} \qquad q = \frac{7 \sin 45°}{\sin 50°}$$

$s \doteq 9$ $\qquad q \doteq 6$

#6.



$\sin 30^\circ = \frac{h}{110}$

$h = 110 \sin 30^\circ$

$h = 55$

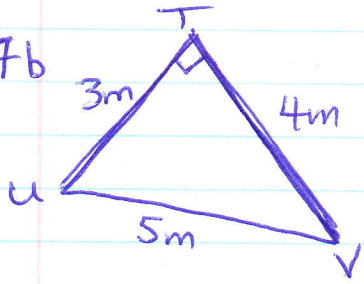
$\sin 70^\circ = \frac{55}{y}$

$y = \frac{55}{\sin 70^\circ}$

$y \doteq 59$

∴ the shortest cable is 59 m.

7b



$\cos T = \frac{3^2 + 4^2 - 5^2}{2(3)(4)}$

$\angle T = 90^\circ$

$\frac{\sin U}{4} = \frac{\sin 90^\circ}{5}$

$\sin U = \frac{4 \sin 90^\circ}{5}$

$U = \sin^{-1}(0.8)$

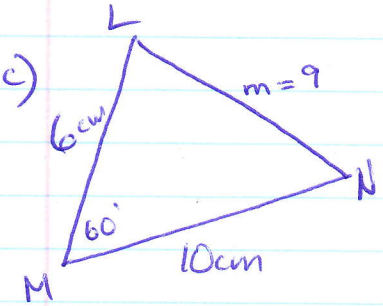
$U \doteq 53^\circ$

$\angle V = 180^\circ - 90^\circ - 53^\circ$

$= 37^\circ$

∴ $\angle V$ is 37°, $\angle U$ is 53° & $\angle T$ is 90°

c)



$m^2 = 6^2 + 10^2 - 2(6)(10)\cos 60^\circ$

$m^2 = 76$

$\sqrt{m^2} = \sqrt{76}$

$m \doteq 8.71779$

$\angle N = 180^\circ - 83^\circ - 60^\circ$

$\angle N = 37^\circ$

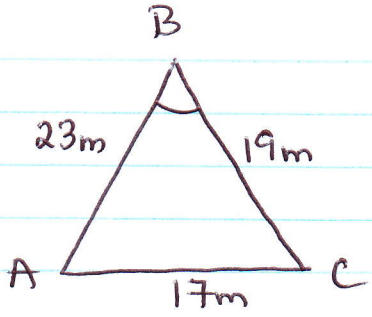
$\frac{\sin L}{10} = \frac{\sin 60^\circ}{8.71779}$

$\sin L = \frac{10 \sin 60^\circ}{8.71779}$

$L = \sin^{-1}(0.9934\ldots)$

$L = 83^\circ$

8.

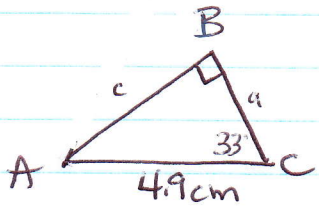


$$\cos B = \frac{19^2 + 23^2 - 17^2}{2(19)(23)}$$

$$\angle B = \cos^{-1}(0.68764302)$$
$$\angle B = 46.55\,61781$$
$$\angle B \doteq 47^\circ$$

$\therefore$ the angle of 47° is required.

9a)



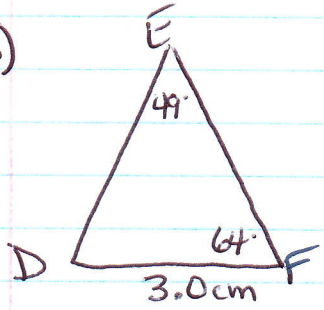
$$\angle A = 180^\circ - 33^\circ - 90^\circ$$
$$= 57^\circ$$

$$\cos 33^\circ = \frac{a}{4.9} \qquad \sin 33^\circ = \frac{c}{4.9}$$

$$a = 4.9\cos 33^\circ \qquad c = 4.9\sin 33^\circ$$
$$a \doteq 4.1 \qquad c \doteq 2.7$$

$\therefore \angle A$ is 57°, side a is 4.1 cm and side c is 2.7 cm

b)



$$\angle D = 180^\circ - 49^\circ - 64^\circ$$
$$= 67^\circ$$

$$\frac{f}{\sin 64^\circ} = \frac{3.0}{\sin 49^\circ} \qquad \frac{d}{\sin 67^\circ} = \frac{3.0}{\sin 49^\circ}$$

$$f = \frac{3.0\sin 64}{\sin 49} \qquad d = \frac{3.0\sin 67^\circ}{\sin 49^\circ}$$

$$f \doteq 3.6 \qquad d \doteq 3.7$$

$\therefore \angle D$ is 67°, side f is 3.6 cm and side d is 3.7 cm.

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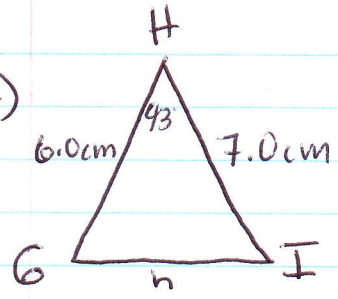
9c)



$h^2 = 7^2 + 6^2 - 2(7)(6)\cos 43°$

$\sqrt{h^2} = \sqrt{23.56628906}$

$h \doteq 4.9$

$\frac{\sin G}{7} = \frac{\sin 43°}{4.8545}$

$\sin G = \frac{7 \sin 43°}{4.8545}$

$\sin G = 0.983415083$

$G = \sin^{-1}(0.983415083)$

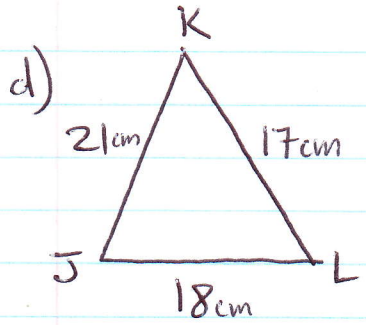
$\angle G \doteq 80°$

$\angle I = 180° - 43° - 80°$

$\angle I = 57°$

∴ side h is 4.9cm, $\angle I$ is 57° and $\angle G$ is 80°

d)



$\cos L = \frac{17^2 + 18^2 - 21^2}{2(17)(18)}$

$\cos L = 0.281045751$

$L = \cos^{-1}(0.281045751)$

$\angle L = 73.67737166$

$\angle L \doteq 74°$

$\frac{21}{\sin 73.677} = \frac{17}{\sin J}$

$\frac{\sin 73.677}{21} = \frac{\sin J}{17}$

$\frac{17 \cdot \sin 73.677}{21} = \sin J$

$\sin J = 0.776893967$

$J = \sin^{-1}(0.776893967)$

$\angle J = 50.9770$

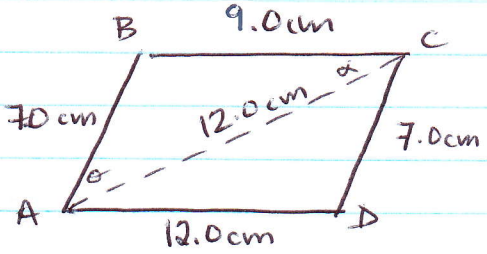
$\angle J \doteq 51°$

$\angle K = 180° - 51° - 74°$

$\angle K = 55°$

∴ $\angle L$ is 74°, $\angle J$ is 51° and $\angle K$ is 55°

10.



$\cos B = \frac{9^2+7^2-12^2}{2(9)(7)}$

$\cos B = -0.111111111$

$B = \cos^{-1}(-0.111111111)$

$B = 96°$

$\frac{\sin\theta}{9} = \frac{\sin 96.3793}{12}$

$\sin\theta = 0.745355992$

$\theta = \sin^{-1}(0.745355992)$

$\theta \doteq 48°$

$\frac{\sin\alpha}{7} = \frac{\sin 96.3793}{12}$

$\sin\alpha = 0.579721406$

$\alpha = \sin^{-1}(0.579721406)$

$\alpha \doteq 35$

$\angle C = 48.1896 + 35.4309$

$\angle C = 83.6$

$\angle C \doteq 84°$

$\therefore \angle C$ and $\angle A$ are $84°$ and $\angle B$ and $\angle D$